

## CLAIMS

What is claimed is:

1. A computer system comprising:  
a computer having a circuit board therein; and  
at least one semiconductor assembly mounted to said circuit board, said at least one semiconductor assembly comprising:  
a substrate having a first surface, a second surface and at least one opening therethrough, said at least one opening in said substrate extending from said first surface to said second surface of said substrate;  
a semiconductor die having an active surface and a back surface, said active surface of said semiconductor die attached to said first surface of said substrate;  
a plurality of bond wires extending through said at least one opening in said substrate and bonded from said active surface of said semiconductor die to said second surface of said substrate; and  
a plurality of conductive bumps disposed between said active surface of said semiconductor die and said first surface of said substrate.
2. The computer system of claim 1, further comprising a processor device electrically connectable to said at least one semiconductor assembly.
3. The computer system of claim 2, further comprising an input device electrically connectable to said processor device.
4. The computer system of claim 2, further comprising an output device electrically connectable to said processor device.

5. The computer system of claim 1, wherein said at least one semiconductor assembly further comprises a filler material located between said semiconductor die and said substrate.

6. The computer system of claim 1, wherein said plurality of conductive bumps comprises power and ground connections between said semiconductor die and said substrate.

7. The computer system of claim 1, wherein said plurality of conductive bumps comprises a portion of signal routing between said semiconductor die and said substrate.

8. The computer system of claim 1, wherein said plurality of bond wires and said plurality of conductive bumps comprise signal routing between said semiconductor die and said substrate.

9. The computer system of claim 1, wherein said at least one semiconductor assembly further comprises a sealant material encapsulating at least said plurality of bond wires.

10. The computer system of claim 9, wherein said sealant material substantially encapsulates exposed portions of said semiconductor die.

11. The computer system of claim 1, wherein said at least one semiconductor assembly further comprises interconnect bumps disposed on said second surface of said substrate.

12. The computer system of claim 11, wherein said interconnect bumps interconnect with said circuit board.

13. The computer system of claim 12, wherein a filler material is disposed between said second surface of said substrate and said circuit board.

14. The computer system of claim 1, wherein said at least one opening of said substrate of said at least one semiconductor assembly is substantially centrally located in said substrate.

15. The computer system of claim 14, wherein said semiconductor die is attached to said substrate having centrally located bond pads on said active surface of said semiconductor die exposed through said at least one opening and outer bond pads on said active surface of said semiconductor die are mirrored with bond pads on said first surface of said substrate having said plurality of conductive bumps therebetween.

16. The computer system of claim 1, wherein said at least one opening of said substrate of said at least one semiconductor assembly comprises a plurality of openings extending proximate more than one side of a periphery of said substrate.

17. The computer system of claim 1, wherein said at least one opening of said substrate of said at least one semiconductor assembly extends proximate more than one side of a periphery of said substrate.

18. The computer system of claim 16, wherein said semiconductor die is attached to said substrate having peripheral bond pads on said active surface of said semiconductor die exposed through said plurality of openings and centrally located bond pads on said active surface of said semiconductor die are mirrored with bond pads on said first surface of said substrate having said plurality of conductive bumps therebetween.

19. A computer system comprising:  
a processor device electrically connected to a circuit board; and  
at least one semiconductor assembly mounted to said circuit board, said at least one semiconductor assembly comprising:  
a substrate having a first surface, a second surface and at least one opening therethrough,  
said at least one opening in said substrate extending from said first surface to said second surface of said substrate;  
a semiconductor die having an active surface and a back surface, said active surface of said semiconductor die attached to said first surface of said substrate;  
a plurality of bond wires extending through said at least one opening in said substrate and bonded from said active surface of said semiconductor die to said second surface of said substrate; and  
a plurality of conductive bumps disposed between said active surface of said semiconductor die and said first surface of said substrate.
20. The computer system of claim 19, further comprising an input device electrically connectable to said processor device.
21. The computer system of claim 19, further comprising an output device electrically connectable to said processor device.

22. A computer comprising:  
a computer having a circuit board therein having a circuit thereon; and  
at least one semiconductor assembly connected to the circuit of the circuit board, said at least one semiconductor assembly comprising:  
a substrate having a first surface, a second surface and at least one opening therethrough,  
said at least one opening in said substrate extending from said first surface to said second surface of said substrate;  
a semiconductor die having an active surface and a back surface, said active surface of said semiconductor die attached to said first surface of said substrate;  
a plurality of bond wires extending through said at least one opening in said substrate and bonded from said active surface of said semiconductor die to said second surface of said substrate; and  
a plurality of conductive bumps disposed between said active surface of said semiconductor die and said first surface of said substrate.